REMARKS

As a preliminary matter, Applicants note that an acknowledgment of the receipt and consideration of the Information Disclosure Statement (IDS) filed on February 21, 2003 has not been received. As an indication of consideration of the references cited in the IDS, Applicants respectfully request an initialed copy of the Form PTO-1449 that accompanied the IDS.

Claims 1-15 stand rejected under 35 U.S.C. § 103 as being unpatentable over United States Patent No. 6,280,813 to Carey et al. in view of United States Patent No. 6,221,481 to Wu et al. Claims 5, 7-9, 11, 14 and 15 have been cancelled, without prejudice. Accordingly, this rejection has been rendered moot with respect to Claims 5, 7-9, 11, 14 and 15. However, with respect to Claims 1-4, 6, 10, 12 and 13, Applicants respectfully traverse this rejection.

Applicants respectfully submit that one of ordinary skill in the art, upon considering the Wu et al. reference, would not have modified the Carey et al. magnetic recording medium in the manner proposed by the Examiner, and therefore the claimed invention of independent Claims 1 and 10 would not have resulted.

The Carey et al. reference shows a magnetic recording medium that includes, as shown in Figure 3, two CoPtCrB ferromagnetic films that sandwich a non-ferromagnetic spacer film made from Ru (with optional Co interface films surrounding the Ru film). As correctly acknowledged by the Examiner, the Carey et al. reference fails to disclose or

suggest the claimed lattice mismatch of 6% or less between the spacer film and the ferromagnetic films. Accordingly, the Examiner relied upon the Wu et al. reference.

The Wu et al. reference discloses, as shown in Figure 2, a magnetic recording medium with a CoCrPtTa magnetic layer positioned above a CoCrTa intermediate layer. The Wu et al. reference also discloses that the CoCrTa intermediate layer provides a smooth lattice match transition for epitaxial growth of the CoCrPtTa magnetic layer. *See* Wu et al., col. 6, lines 27-33. In fact, the Wu et al. reference discloses multiple times that an intermediate layer of this particular material (high Cr content CoCrTa) provides several benefits, including the smooth lattice match transition. *See e.g.*, Wu et al., Abstract, lines 5-8; col. 4, lines 40-53; col. 3, lines 62-67; col. 5, lines 19-24; col. 6, lines 6-14; col. 6, lines 22-39. However, the Wu et al. reference fails to disclose or suggest that the same lattice match can be obtained with other materials, such as the claimed Ru-M3 allow.

Accordingly, assuming *arguendo* that one of ordinary skill in the art would have modified the Carey et al. medium in light of the Wu et al. reference, Applicants respectfully submit that they would have substituted the CoCrTa intermediate layer of Wu et al. for the Ru intermediate layer of Carey et al. This is the case because the Wu et al. reference fails to disclose or suggest a method of modifying an Ru layer in order to obtain a smooth lattice transition. Instead, the Wu et al. reference simply discusses the benefits of using a CoCrTa intermediate layer below a CoCrPtTa magnetic layer. Since the Wu et al. reference discloses the benefits of a specific material, without any disclosure of how to

obtain those same benefits from another material (such as Ru), Applicants respectfully submit that one of ordinary skill in the art would not have modified the Ru intermediate layer of Carey et al. by making it into an "Ru-M3 alloy, where M3=Co, Cr, Fe, Ni, Mn or alloys thereof" with a lattice mismatch of "approximately 6% or less by addition of M3," as defined in independent Claims 1 and 10. Nor do any of the other references disclose or suggest such a modification to an Ru layer.

Moreover, the Wu et al. reference also discloses that some of the benefits of the CoCrTa intermediate layer are obtained due to the "like-atoms-growth effect" that occurs when the CoCrPtTa layer is grown upon the CoCrTa intermediate layer. *See* Wu et al., col. 6, lines 33-36. Applicants respectfully submit that since the Ru intermediate layer of Carey et al. is not a "like-atom" layer to the CoPtCrB ferromagnetic layer in Carey et al., one of ordinary skill in the art would not have assumed that the same benefits could be obtained from the Ru layer of Carey et al. Instead, in light of Wu et al., one of ordinary skill in the art would have substituted the CoCrTa intermediate layer for the Ru layer, because the CoCrTa intermediate layer appears to include more "like-atoms" to the CoPtCrB magnetic layer (i.e. both Co and Cr). In the alternative, one of ordinary skill in the art may have also substituted the CoCrPtTa magnetic layer of Wu et al. for the CoPtCrB magnetic layer of Carey et al. in order to obtain an even greater "like-atom" effect with the atoms of the CoCrTa intermediate layer (i.e. to obtain three "like atoms" -- Co, Cr and TA -- in both layers.). However, neither of these substitutions would have resulted in the claimed invention, which includes a non-

magnetic coupling layer made of Ru-M3 alloy, where M3 = Co, Cr, Fe, Ni, Mn, or alloys thereof.

With regard to the Carey et al. reference, the Examiner asserts that column 7, lines 52-55 of this reference suggest adding Cr, Rh, Ir or Cu to an Ru spacer layer. Applicants respectfully disagree. Initially, the passage referred to by the Examiner states that the spacer film can be made from Ru, Cr, Rh, Ir, Cu "and their alloys." However, the passage does not state what other materials, out of all the elements and compounds in existence, can be added to either Ru, Cr, Rh, Ir, or Cu to make an alloy. Moreover, the Carey et al. reference does not state that Ru (or any of the other elements listed) should be combined with one or more of the other elements listed to make an alloy, it only generally states that alloys of each element can be used. Accordingly, Applicants respectfully submit that although the Carey et al. reference does state that the spacer layer can be made of an alloy of Ru, it does not disclose or suggest which materials should be added to Ru.

Further, certain combinations of the materials listed in Carey et al. (Ru, Cr, Rh, Ir, and Cu) would actually produce undesirable results. For example, adding excessive Cr content (50at% or more) to an Ru spacer layer would result in transition from an hcp structure to a bcc structure (as evidenced by "Binary Alloy Phase Diagrams," Second Edition, 1990, ASM International, pages 1322-1323, which is cited in an Information Disclosure Statement (IDS) that is being filed concurrently herewith). Hence, unless the Cr content is controlled to a specific range (as in the present invention defined by independent Claims 1

and 10), the mere addition of Cr to the Ru spacer layer will not achieve one of the objects of the present invention -- to improve the in-plane orientation of the magnetic layer.

With regard to adding Rh or Ir to the Ru space layer, such additions would increase the lattice constant due to the atomic radius of these elements, and it is believed that the desired lattice matching cannot be achieved with such combinations of materials. Finally, Ru and Cu are mutually immiscible, and it is believed that the addition of Cu to an Ru spacer layer will not result in a material with a stable crystal state having an hcp structure.

Accordingly, for the foregoing reasons, Applicants submit that the Carey et al. reference does not teach or suggest the use of a non-magnetic coupling layer made from an Ru-M3 alloy, where M3 = Co, Cr, Fe, Ni, Mn or alloys thereof, so that the lattice mismatch between the non-magnetic coupling layer and the magnetic layer and the ferromagnetic layer respectively disposed above and below the non-magnetic coupling layer is adjusted to approximately 6% or less by the addition of M3, as defined in independent Claims 1 and 10.

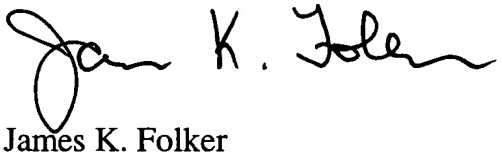
Thus, Applicants respectfully submit that neither the Wu et al. reference, nor any of the other cited references (including the Carey et al. reference), discloses or suggests how to make a 6% or less lattice mismatch between a non-magnetic coupling layer and the magnetic/ferromagnetic layers above and below the coupling layer, where that coupling layer is an Ru-M3 alloy, and where M3 = Co, Cr, Fe, Ni, Mn, or alloys thereof. Accordingly, for all of these reasons, Applicants respectfully request the withdrawal of this § 103 rejection of independent Claims 1 and 10 under Carey et al. in view of Wu et al.

Claims 2-4, 6, 12 and 13 all depend, directly or indirectly, from independent Claim 1, and therefore include all of the features of Claim 1, plus additional features. Accordingly, Applicants respectfully request that the § 103 rejection of dependent Claims 2-4, 6, 12 and 13 under Carey et al. in view of Wu et al. be withdrawn considering the above remarks directed to independent Claims 1 and 10.

For all of the above reasons, Applicants request reconsideration and allowance of the claimed invention. Should the Examiner be of the opinion that a telephone conference would aid in the prosecution of the application, or that outstanding issues exist, the Examiner is invited to contact the undersigned.

Respectfully submitted,

GREER, BURNS & CRAIN, LTD.

By 

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September 8, 2003

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